

*Iowa.*—Fort Madison, 3d.  
*Kansas.*—Ninnescah, 6th.  
*New Jersey.*—Morristown, 16th.  
*New York.*—Haine's Falls, 3d.  
*Ohio.*—Yellow Springs, 23d, 24th; Napoleon, 3d; Wauseon, 3d, 4th, 18th.  
*South Carolina.*—Stateburg, 10th, 16th.  
*Tennessee.*—Nashville, 16th, 24th.  
*Texas.*—El Paso, 7th, 15th, 27th.  
*Virginia.*—Wytheville, 4th, 5th, 16th, 17th, 24th; Dale Enterprise, 24th.  
*Wisconsin.*—Prairie du Chien, 21st, 22d.  
*Wyoming.*—Fort Bridger, 9th, 10th.

## SAND AND DUST STORMS.

Yuma, Arizona, 14th.  
 Fort McDowell, Arizona, 22d.  
 Fort Stockton, Texas, 14th.  
 El Paso, Texas, 9th, 14th.  
 Lava, New Mexico, 14th.  
 Walla Walla, Washington Territory, 23d.

## WATER-SPOUTS.

Captain Robert Bayley, of the ship "Reporter," states that he observed numerous water-spouts on the 5th and 6th, which were attended by squalls of rain, hail, and snow. When first observed on the 5th the ship's position was latitude 36° 25' N., longitude 73° 0' W.

## MIGRATION OF BIRDS.

*Geese flying northward.*—Cahuenga, California, 1st, 9th; Indianola, Texas, 3d, 23d; Tatoosh Island, Washington Territory, 5th, 9th; San Rafael, California, 7th; Stockham, Nebraska, 8th; Yates Centre, Kansas, 9th, 15th, 18th; Knights-town, Indiana, 11th; Fort Madison, Iowa, 13th, 28th; Westmoreland, Kansas, 14th; Elk Falls, Kansas, 15th; Yutan, Nebraska, 17th, 20th, 25th; Swanwick, Illinois, and Wellington, Kansas, 18th; Ninnescah, Kansas, 19th, 20th; Allison, Kansas, 19th to 22d; Fort McDermitt, Nevada, 20th; Fairbury, Nebraska, 21st; North Platte, Nebraska, 22d; Saint Louis, Missouri, 23d; Keokuk, Iowa, 24th; Salina, Kansas, 25th; Sacramento, California, and Cape Henlopen, Delaware, 28th.

*Geese flying southward.*—Fort Scott, Kansas, 12th; Cairo, Illinois, 18th; Fort Madison, Iowa, 24th, 27th.

*Ducks flying northward.*—Stockham, Nebraska, 8th; Westmoreland and Elk Falls, Kansas, 14th; Yates Centre, Kansas, 17th, 21st; Yutan, Nebraska, 19th, 23d; Indianola, Texas, 22d.

*Ducks flying westward.*—Yuma, Arizona, 1st; Yates Centre, Kansas, 18th.

*Meteorological record of voluntary observers and Army post surgeons, February, 1886.*

The maximum and minimum temperatures at stations marked thus (\*) are from readings of other than standard instruments.

Stations.	Temperature.				Rainfall.	Stations.	Temperature.				Rainfall.
	Maximum.	Minimum.	Mean.				Maximum.	Minimum.	Mean.		
<i>Alabama.</i>	o	o	o		<i>Inches</i>	<i>California—Cont'd.</i>	o	o	o		<i>Inches</i>
Birmingham *	65	10	42.5	2.59		Cahuenga	70	32		1.21	
Greensborough	75	14	48.0	5.34		College City	71	44	57.3	trace.	
Mount Vernon B'ks.	73	18	50.5	2.37		Gaston, Fort	75	26	49.8	5.29	
Prattville	87	20	43.7	4.91		Mason, Fort	71	44	57.3	trace.	
<i>Arizona.</i>						Murielotta *	80	31	51.2	0.48	
McDowell, Fort	85	32	57.2	1.54		Nicolaus *	74	38	55.0	0.49	
Verde, Fort	78	24	49.6	0.96		Oakland	67	40	54.6	0.30	
Tucson				0.36		Oroville *	70	44	57.1	0.36	
<i>Arkansas.</i>						Poway *	83	42	56.0	2.64	
Lead Hill *	73	-11	36.2	2.61		Presidio of San F	73	38	54.5	0.10	
Mount Ida	70	10	38.2	3.00		Princeton *	75	34	53.8	0.17	
<i>British Columbia.</i>						Sacramento *	74	37	53.0	0.35	
New Westminster	52	34		4.92		Salinas	73	38	52.6	1.47	
<i>California.</i>						Santa Barbara	70	45	59.6	1.19	
Alcatraz Island	68	40	54.2	0.15		San Rafael	78	32	54.5	0.28	
Anderson *	66	33	51.8	0.38		Susanville	62	27	40.2	0.62	
Angel Island	79	39	57.0	0.12		<i>Colorado.</i>					
Benicia Barracks	66	41	54.1	0.07		Colorado Springs	66	3	35.8	0.30	
Bidwell, Fort	64	21	42.8	1.22		Lyon, Fort	70	10	34.8	trace.	
Blue Lake	71	27	49.5	6.25		Pueblo	73	4	39.5	0.42	
						Salida				0.17	

## Meteorological record of voluntary observers, etc.—Continued.

Temperature.					Temperature.				
Stations.	Maximum.	Minimum.	Mean.	Rainfall.	Stations.	Maximum.	Minimum.	Mean.	Rainfall.
<i>Connecticut.</i>					<i>Kansas—Cont'd.</i>				
Bethel	o	o	o	<i>Inches</i>	Wakefield *	64	-5	31.7	0.76
Hartford	54	-8	24.1	6.16	Wellington	66	-10	32.0	1.08
North Colebrook *	54	-21	18.5	2.93	W. Leavenworth *	63	-8		
Southington	56	-10	24.9	5.47	Westmoreland *	59	-10	26.0	1.20
Voluntown				11.25	Wyandotte	62	-11	25.5	0.67
<i>Dakota.</i>					Yates Centre	66	-8	31.0	1.62
Abr. Lincoln, Fort	62	-27	15.1	0.70	<i>Kentucky.</i>				
Meade, Fort	68	-16	30.6	0.67	Frankfort	59	-14	30.9	3.18
Pembina, Fort	47	-38	1.1	4.59	Richmond	60	-10	31.9	5.62
Randall, Fort	65	-21	26.5	0.32	<i>Louisiana.</i>				
Richardson *	50	-22	16.4	1.00	Grand Coteau	73	27	54.1	1.37
Siweton, Fort	54	-36	12.1	0.65	Liberty Hill *	68	28	52.5	4.82
Sully, Fort	66	-19	25.5	0.17	Luling *	75	26		3.25
Totten, Fort	45	-35	7.1	0.67	<i>Maine.</i>				
Vermillion *	60	-26	24.1	0.59	Bar Harbor	48	-12		
Webster	61	-24	18.1	1.93	Buckfield *	58	-16		5.22
Yates, Fort	63	-24	18.4	0.22	Cornish *	47	-11	18.9	6.00
<i>District of Columbia.</i>					Gardiner	46	-10	20.6	7.25
Distributing Res't *	66	-2	32.0	3.72	Kent's Hill	48	-15	17.4	6.60
Kendall Green	64	-4	31.0	2.51	Orono *	50	-21	18.3	5.42
Receiving Res't y'r *	64	-4	30.9	3.20	<i>Maryland.</i>				
Rock Creek Bridge *	67	0	35.1		Cumberland	52	-6	29.9	1.83
<i>Florida.</i>					Emmitsburg	56	-4	28.0	4.52
Archer *	78	23	52.6	1.57	Fallston *	55	-6	29.7	5.96
Limona *	84	32	64.5	0.94	Great Falls *	65	-2	29.2	2.79
Manatee *	82	33	58.9	0.55	McDonogh	62	-8	34.0	3.29
Meade, Fort				0.25	McHenry, Fort	64	-1	31.0	3.28
Morritt's Island	78	38	60.2	0.45	Woodstock	63	-7	28.7	4.79
Saint Augustine, Ft.	77	26	53.0	3.32	<i>Massachusetts.</i>				
Tallahassee *	72	18	49.0	1.60	Amherst a *	49	-6	25.2	4.36
<i>Georgia.</i>					Amherst b	52	-11	23.1	3.94
Athens	69	10	41.8	2.51	Blue Hill Obs'y	55	-10	23.2	8.29
Forsyth *	76	13	47.4	2.20	Deerfield	49	-12	22.9	3.24
Milledgeville	70	13	44.5	1.56	Dudley	60	-16	21.6	5.12
Quitman *	72	21	51.6	2.10	Fall River	55	-5	27.8	11.17
<i>Idaho.</i>					Heath *	52	-18		
Boise Barracks	65	19	42.3	0.38	Mendon *	49	-8	26.5	7.70
Coeur d'Alene, Fort	58	15	37.6	0.89	Milton	55	-8	26.5	7.70
<i>Illinois.</i>					New Bedford	48	-6	26.7	6.97
Anna *	59	-7	33.8	2.38	Princeton	46	-13	20.5	5.32
Bloomington	52	-17		1.43	Somerset *	58	-12	27.2	8.70
Bunker Hill	57	-12	29.6	1.33	Taunton	59	-9	27.3	8.85
Collinsville	58	-9	31.4	1.59	Worcester *	48	-9	22.2	6.32
Charleston *	55	-14	27.5	1.04	Westborough *	56	-10	26.5	6.28
Geneseo *	50	-22	22.3	1.98	Williamstown	54	-17	21.1	2.61
Mattoon *	58	-11	30.0	1.10	<i>Michigan.</i>				
Pekin *	50	-20	25.7	3.65	Birmingham	45	-20		1.36
Peoria	52	-15	29.2	1.86	Brady, Fort	47	-39	12.1	4.04
Riley	42	-21	19.9	1.61	Harrisville *	49	-27		2.15
Rockford *	44	-20	20.9	3.40	Hudson	50	-26		0.18
South Evanston	48	-15		2.25	Kalamazoo	50	-9		1.64
Swanwick	54	-6	29.8	1.31	Lansing	51	-18	22.4	1.64
Sycamore	48	-17	21.2	1.85	Mottville *	52	-18		
Windsor	54	-12	27.7	1.22	Northport	42	-16		1.68
<i>Indian Territory.</i>					Pontwater	54	-26	22.0	2.85
Reno, Fort	69	-9	38.8	1.25	Thornville	49	-11	22.8	1.09
Supply, Fort	74	-6	37.4	0.40	Traverse City *	50	-30		2.51
<i>Indiana.</i>					<i>Minnesota.</i>				
Fort Wayne *	57	-3	29.5	0.87	Minneapolis	46	-29	14.3	0.55
Gulford *	55	-6	28.3	1.68	Preston *	42	-38		
Jeffersonville	59	-4	30.9	2.16	Snelling, Fort	48	-38	14.5	0.40
Knights-town	56	-12	27.4	0.69	<i>Missouri.</i>				
Lafayette	55	-15	26.2	1.32	Carthage	65	-10	35.6	
LuGrange	52	-13	23.8	1.06	Central College *	58	-14	30.4	0.90
Laconia	60	7		2.73	Centerville	85	-16		2.11
Mauzy	55	-16	23.0	1.14	Conception *	52	-22	25.6	0.75
Spiceland	54	-11	26.7	1.01	Frankford *	67	-14		1.16
Sunman *	54	-13	28.0	1.69	Pierce City *	64	-9	34.2	1.80
Terre Haute *	54	-4		1.20	Springfield *	59	-10	33.0	3.43
Vevay	60	-6	30.6	1.51	Warrenton *	58	-16	28.5	
<i>Iowa.</i>					<i>Montana.</i>				
Bancroft	44	-32	15.7	0.24	Assinaboine, Fort	63	-20	29.2	0.39
Cedar Rapids a *	48	-24	21.7	0.27	Ellis, Fort	66	-12	33.1	1.16
Cedar Rapids b *	46	-33	21.6		Keogh, Fort	57	-15	28.5	0.50
Clinton *	49	-25		1.91	Missoula, Fort	51	-5	33.3	0.49
Cresco	39	-30	14.2	0.95	Shaw, Fort	66	-21	35.4	1.04
Des Moines	53	-29	22.0		<i>Nebraska.</i>				
Independence *	41	-21	19.2	0.80	Crete	63	-17	26.0	0.92
Logan		-34	22.0	0.30	De Soto *	57	-28	24.1	0.41
Fort Madison	52	-23		0.90	Fairbury *	65			0.98
Manchester	45	-20	20.0	1.09	Freemont *	62	-23	22.3	0.46
Monticello *	46	-24	19.8	1.31	Genoa	60	-17	24.5	0.39
Mount Vernon *	51	-26	21.4		Hay Springs *	63	-5	29.2	0.93
Muscatoine	48	-21	21.2	1.43	Marquette *	50			0.69
Oskaloosa a *	52	-23	21.9	0.35	Niobrara, Fort	78	-15	28.4	0.84
Oskaloosa b *	52	-23			Robinson, Fort	71	-5	33.7	0.57
West Union	42	-26	17.5	0.88	Sidney, Fort	74	-8	33.5	0.13
<i>Kansas.</i>					Stockham *	68			0.75
Allison	67	0	33.8	0.65	Sidney	72	10		
El Dorado	63	-3	32.7		Yutan *	52	-20	25.0	0.64
Elk Falls				1.56	<i>Nevada.</i>				
Emporia *	62	-8	34.1	trace.	Carson City	68	20	42.2	0.28
Fort Scott	65	-8	34.4	1.27	Hallock, Fort	64	10	36.2	0.50
Hay, Fort	68	-6	31.8	1.44	McDermitt, Fort	63	20	39.5	0.40
Independence *	67	-10	33.5	1.48	<i>New Hampshire.</i>				
Lawrence	62	-7	31.6	0.56	Ashland				5.27
Manhattan a	60	-7	30.2	0.39	Belmont				4.61
Manhattan b *	69	-7	31.2	0.25	Borlin Mills	49	-30	14.3	2.60
Ninnescah *	63	-2	32.8	1.47	Bristol				4.41
Ottawa	64	-7	31.0	0.81	Lake Village				4.72
Riley, Fort	63	-9	30.8		Nashua	52	-8	23.1	5.71
Salina *	60	1	37.0	0.04	Wier's Bridge				4.49

## Meteorological record of voluntary observers, etc.—Continued.

Stations.	Temperature.			Rainfall.	Stations.	Temperature.			Rainfall.
	Maximum.	Minimum.	Mean.			Maximum.	Minimum.	Mean.	
<i>N. Hampshire—Con.</i>	o	o	o	Inches	<i>Pennsylvania—Con.</i>	o	o	o	Inches
Wolfeborough	60	4	28.3	4.58	Easton	63	5	27.8	5.28
Woodstock	60	4	28.3	4.19	Fallington	50	18	19.8	5.67
<i>New Jersey.</i>					Franklin	50	18	19.8	3.32
Beverly	62	4	28.3	4.58	Germantown	63	8	27.8	6.97
Clayton	60	2	29.6	8.00	Grampian Hills	56	14	22.8	1.90
Dover	60	7	25.7	5.02	Mahanoy Plane	54	6	28.6	5.59
Moorestown	64	4	27.5	6.02	Phillipsburg	55	0	25.0	
Paterson	58	0	28.5	5.42	Quakertown	55	4	27.4	5.74
Phillipsburg	48	2	28.3	4.91	South Bethlehem	59	9	30.4	4.41
Princeton	61	5	27.4	4.59	Troy	48	7	21.6	
Readington	58	0	31.9		Wellsborough	50	10	25.1	0.95
South Orange	52	2	28.2	4.60	West Chester	62	5	27.2	6.22
Vineland	60	10	31.0	5.94	Wysox	54	3	26.6	0.95
<i>New Mexico.</i>					Zionsville	55	2	31.7	6.00
Bayard, Fort	78	18	47.0	1.67	<i>South Carolina.</i>				
Gallinas Spring	67	25		1.50	Alken	69	12	45.8	2.20
Puerto de Luna	69	14	41.1	0.71	Kirkwood	61	8	38.8	1.59
Selden, Fort	80?	19	47.6	0.10	Pacolet	58	12	39.6	2.34
Union, Fort	69	7	30.4	trace	Spartanburg	49	33	42.0	2.30
Wingate, Fort	62	10	35.4	0.94	Stateburg	68	14	44.7	1.46
<i>New York.</i>					<i>Tennessee.</i>				
Auburn	55	11	25.4	3.03	Ashwood	63	8	27.5	2.89
Cooperstown	50	13	20.0	1.86	Austin	64	22	35.0	4.79
David's Island	56	4	26.8	3.25	Milan	61	17	30.2	6.21
Factoryville	52	8	20.3	0.94	Paris	57	14	34.4	12.62
Haines Fall	51	16	19.3		<i>Texas.</i>				
Humphrey	49	14	23.0	1.70	Austin	85	25	54.8	2.18
Ithaca	53	10	24.2		Clark, Fort	93	29	58.4	1.20
LeRoy	57	5	23.9	2.02	Concho	87	17	50.8	0.80
Madison Barracks	51	32	17.1	2.12	Corsica	82	23	47.7	2.51
Menand Station	46	14	22.5	1.46	Huntsville	87	27	59.7	3.05
Mountainville	54	7	25.8	3.94	McIntosh, Fort	84	12	47.7	0.79
Niagara, Fort	49	11	23.2	1.58	Midland	82	12	47.7	0.33
North Volney	48	17	20.7	2.25	Ringgold, Fort	98	33	62.5	1.58
Palermo	49	19	19.0	2.36	New Ulm	87	23	54.2	1.65
Palmyra	51	4			Silver Falls	73	19		trace
Penn Yan				1.06	<i>Vermont.</i>				
Plattsburg Bks	49	21	18.5	1.22	Brattleborough	52	14	21.0	3.14
Betauket	55	3	28.2	7.08	Burlington	50	12	18.2	1.05
Syracuse	47	4			Charlotte	48	24	16.8	2.00
West Point	58	10	25.3	4.24	Dorset	54	20	18.9	3.16
White Plains	52	9	27.5	6.40	Lunenburg	46	25	15.4	1.67
<i>North Carolina.</i>					Newport	46	30	14.0	3.23
Chapel Hill	67	3	38.6		Post Mills Village	44	30	15.5	
Lenoir	56	4		0.18	Poultney	24	18.0	3.94	
Lincolnton				1.90	Stratford	44	24	16.4	2.70
Raleigh	69	6	39.0	2.10	Stowe	54	24		
Reidsville	63	5	35.6	0.74	<i>Virginia.</i>				
Statesville	62	4	39.5	2.74	Accotink	68	4	32.6	4.95
Wake Forest	68	3	40.4	2.35	Bird's Nest	60	2	35.6	5.00
Weldon	68	7	38.2	2.16	Bringington				3.70
<i>Ohio.</i>					Dale Enterprise	62	8	32.7	3.59
Cincinnati	68	2	31.4	1.65	Marion	57	12	30.0	1.57
Cleveland	56	6	25.7	1.77	Monroe, Fort	66	1	36.6	3.30
Clyde	62	10			Snowville	59	5		1.60
College Hill	72	12	32.1	2.00	Summit	60	10	32.3	
Garrettsville	56	20	22.0	1.35	University of Va	63	7	32.5	3.05
Fosteria	66	8	25.2	1.05	Variety Mills	62	16	32.6	4.02
Hiram	56	12	23.1	1.50	Wytheville	62	7	33.3	1.53
Jacksonborough	58	12	20.8	1.51	<i>Washington Territory.</i>				
Napoleon	58	8	27.5	0.47	Bainbridge Island	66	29	45.5	1.96
North Lewisburg	60	11	28.3	1.55	Kenewick	72	16		0.19
Ruggles	54	8	21.9	1.00	Pleasant Grove	58	14		0.36
Tiffin	60	6	24.8	1.40	Spokane, Fort	53	17	36.4	0.28
West Milton	62	10	28.1	1.00	Tacoma	59	30	43.5	2.29
Wauseon	57	18	25.0	0.84	<i>West Virginia.</i>				
Westerville	60	10	2.5	1.64	Chickasaw	66	4		1.29
Yellow Springs	61	13	28.2	2.36	Helvetia	62	24	29.0	2.71
<i>Oregon.</i>					Parkersonburg	64	10	30.5	0.28
Albany	64	32	46.4	3.34	<i>Wisconsin.</i>				
Baudon	58	30	43.6	5.66	Embarras	50	30	17.4	2.25
East Portland	60	26		2.03	Evansville	47	20	23.0	
Eola	60	30	43.4	1.94	Madison	43	21	19.7	2.35
Klamath, Fort	63	15	37.4	1.83	Manitowoc	46	22	21.2	0.80
Pendleton	60	22	41.2	0.77	Neillville	45	48	6.1	0.33
<i>Pennsylvania.</i>					Prairie-du-Chien	49	25	20.4	0.95
Altoona	55	3	32.0	0.87	<i>Wyoming.</i>				
Bethlehem	55	4	28.1	4.68	Bridger, Fort	50	5	31.4	0.60
Blooming Grove	61	12	24.4	3.20	Fred Steele, Fort	55	0	29.8	0.24
Catawissa	56	6	25.5	2.75	Laramie, Fort	65	7	35.5	0.07
Drifton	59	12	36.0	3.47	Washakie, Fort	69	2	35.8	0.10
Dyberry	50	13	21.5	2.43					

## NOTES AND EXTRACTS.

The following is an extract from the February, 1886, report of the "Alabama Weather Service," under direction of Prof. P. H. Mell, jr., Auburn:

This month has presented no special features requiring marked attention; the season, however, has been excellent for farming operations and the fruit trees have been much benefited by the favorable weather. The temperature was 5° below the average.

There were three cold waves that swept over the state during the month, all of which were accurately predicted by the Chief Signal Officer, and timely warnings were given to all the telegraph stations throughout the territory belonging to the "Alabama predicting system."

The precipitation was also small and was 1.61 inches below the average, but the distribution was very uniform. A fall of snow was reported by some stations, but too small to be of much importance.

The following items from the observers will be read with interest: Birmingham reports that on the 26th the weeping willows and lilacs were putting forth leaves; Trinity, however, states that the trees have not yet given signs of budding and that very little has been done in the way of farming. At Tuscomb the bulbous roots began to show their green tops above the surface of the earth on the 26th; the maple and some other trees were also budding on that date. Centre reports as follows: "On the 11th there was a considerable thunderstorm throughout the country between 6 and 7 p. m., accompanied by vivid lightning and a high wind. At Leesburg, five miles from here, it had some of the characteristics of a tornado. It took off the top of a large frame storehouse and crushed in the sides; the rafters were carried nearly a quarter of a mile and some of them were driven endways several feet into the ground. The storm was from the southwest and continued fifteen or twenty minutes. Leesburg was the first place in the county where the storm struck, and no damage was reported elsewhere. At the time of the storm the thermometer was 56° and its average for the day was 55°."

Greensborough states that the season is very backward in that part of the state. The first crocus and white hyacinth bloomed on the 9th; elms on the 14th. The first moths were noticed flying around on the evening of the 14th. No leaf buds were detected at the close of the month.

This month closes the meteorological year of the Alabama Weather Service; in some respects the year has been noted. For instance, the spring was very backward. An unusual amount of precipitation occurred in September, and there were tornadoes in Dallas on the 30th of April, and in Decatur, and near Selma, on the 6th of November. Exceptional cold weather occurred from the 8th to the 14th of January. Tuscaloosa shows a greater precipitation than Mobile, which is something remarkable, when we consider that Mobile is in the region of heavy rainfalls. Union Springs is the driest spot in the state.

The last damaging frost for the spring of 1885 occurred on the 13th of April. The first frost in the fall was on the 22d of October.

The prevailing direction of the wind was northwest.

## State summary.

Mean temperature, 43° 6'; highest temperature, 86°, at Prattville, on the 24th; lowest temperature, 4°, at Gadsden, on the 5th; range of temperature, 82°; greatest monthly range of temperature, 72°, at Prattville; least monthly range of temperature, 40°, at Russellville and Marion; mean daily range, 16°; greatest daily range of temperature, 49°, at Carrollton, on the 23d; least daily range of temperature, 1°, at Livingston, on the 8th; Selma on the 27th; Russellville, on the 12th; and Tuscomb, on the 12th.

Mean depth of rainfall, 3.18 inches; mean daily rainfall, 0.114; greatest depth of monthly rainfall, 5.34 inches, at Newton; least depth of monthly rainfall, 1.20 inches, at Jacksonville; greatest daily rainfall average for state, 2.16 inches, on the 3d; greatest daily local rainfall, 2.54 inches, at Oswichee, on the 27th.

Average number of days on which rain fell, 5; average number of cloudy days, 9; average number of fair days, 8; average number of clear days, 11.

Warmest days, 14th and 23d; coldest days, 4th and 5th.

Prevailing direction of wind, northwest.

## Annual summary.

Average temperature of each month for the whole year.—March, 49° 8'; April, 64° 0'; May, 69° 7'; June, 78° 5'; July, 80° 5'; August, 78° 9'; September, 73° 1'; October, 60° 1'; November, 52° 6'; December, 44° 1'; January, 37° 9'; February, 43° 6'.

Average temperatures for the seasons.—Spring, 61° 2'; summer, 79° 8'; autumn, 61° 9'; winter, 41° 9'. For North Alabama: spring, 58° 0'; summer, 77° 6'; autumn, 59° 5'; winter, 38° 2'. For Central Alabama: spring, 61° 9'; summer, 79° 6'; autumn, 62° 5'; winter, 42° 2'. For South Alabama: spring, 63° 8'; summer, 80° 0'; autumn, 64° 7'; winter, 45° 2'.

Average precipitation of each month for the whole state (in inches).—March, 2.99; April, 4.16; May, 6.21; June, 3.88; July, 4.24; August, 3.76; September, 5.32; October, 2.50; November, 4.41; December, 2.87; January, 6.63; February, 3.18.

Average precipitation for the seasons (in inches).—North Alabama: spring, 10.63; summer, 12.64; autumn, 13.89; winter, 12.34; total, 49.50. Central Alabama: spring, 13.21; summer, 10.92; autumn, 11.70; winter, 14.29; total, 50.12. South Alabama: spring, 16.27; summer, 12.09; autumn, 11.36; winter, 11.41; total, 61.13.

The following is an extract from the February, 1886, "Weather Review of the Illinois Weather Service," under direction of Mr. Charles F. Mills, of the Illinois Department of Agriculture, Springfield:

The "Review" contains a general summary of the conditions which prevailed over Illinois during the month of February, 1886, based upon the reports received from the Signal Service and voluntary observers reporting to the Illinois Department of Agriculture.

The state covers such an extended area from north to south (385 miles) that it has been found advisable to divide the same and follow the judicial divisions, which include the following territory, viz., the northern division extends from 42° 30' to about 40° 31'; the central division extends from about 40° 31' to about 39°; the southern division, from about 39° to 36° 51'.

Atmospheric pressure.—The highest barometer reported at the twenty-one

stations during the month of February, was on the 4th, at fifteen stations, and on the 2d, 3d, 5th, 6th, 10th, 18th, and 23d, at one station each. The lowest barometer reported at the twenty-one stations during the month was on the 13th, at sixteen stations, and on the 9th, 11th, 20th, 21st, and 25th, at one station each. The highest barometer, as expressed in inches and hundredths, reported in February during the past five years was as follows: 1882, 30.594; 1883, 30.850; 1884, 30.730; 1885, 30.700; 1886, 30.873. The lowest barometer in February for the same years was as follows: 1882, 28.870; 1883, 29.030; 1884, 28.920; 1885, 29.134; 1886, 28.630. The mean barometer for the same month was as follows: 1882, 29.857; 1883, 30.109; 1884, 30.021; 1885, 30.088; 1886, 29.925.

**Temperature.**—The mean temperature of February, 1886, was lower than the average of the same month at all except four of the stations from which observations have been received for a term of years. The mean temperature of the month was above the normal at the following stations: At Aurora, Kane county, the mean temperature of February, 1886, was 3°.06 above the mean of the month for a term of years; Prairieville, Lee county, 2°.30; Griggsville, Pike county, 3°.03; and Fairfield, Wayne county, 4°.04. The mean temperature of February, 1886, was below the average of the month at the following stations: Marengo, McHenry county, 2°.10 below; Sycamore, DeKalb county, 0°.49; Chicago, Cook county, 0°.09; Davenport, Iowa, 3°.63; Peoria, Peoria county, 0°.05; Keokuk, Iowa, 3°.05; Springfield, Sangamon county, 0°.76; Mattoon, Coles county, 1°.22; Bunker Hill, Macoupin county, 4°.61; Palestine, Crawford county, 1°.57; Greenville, Bond county, 2°.29; Collinsville, Madison county, 3°.80; Saint Louis, Missouri, 0°.37; Swanwick, Perry county, 3°.20; McLeansborough, Hamilton county, 0°.23; Anna, Union county, 4°.32; Golconda, Pope county, 2°.59; Cairo, Alexander county, 4°.82. The average mean temperature of February for the last twelve years was 29°.27, which was 1°.91 higher than the mean temperature for February, 1886. The mean temperature of February, 1876, 1877, 1878, 1879, 1880, 1882, and 1884, was higher than that of February, 1886; and February, 1875, 1881, 1883, and 1885, was colder than February, 1886. The highest mean temperature for February during the past twelve years was 30°.59, in 1882, and the lowest, 16°.15, in 1875.

The highest temperature of the month was reported on the 10th, at twenty-two stations; on the 22d, at fourteen; on the 24th, at eleven; on the 23d, at six; on the 8th and 9th, at four each; on the 11th, 13th, and 18th, at two each; and on the 12th and 15th, at one station each. In the northern division of the state the highest temperature was reported on the 22d at seven stations; on the 10th, at five; on the 24th, at four; on the 9th, at two; and on the 8th, 12th, and 18th, at one each. In the central division the highest temperature reported was on the 22d, at seven stations; on the 10th, at four; on the 8th, 23d, and 24th, at two each; and on the 9th, 13th, and 18th, at one station each. In the southern division the highest temperature noted was on the 10th, at thirteen stations; on the 24th, at five; on the 23d, at four; and on the 8th, 13th, and 15th, at one station each.

The lowest temperature in February, 1886, was reported on the 2d at six stations, on the 3d at twenty-seven, on the 4th at thirty-five, and on the 5th at two. In the northern division of the state the lowest temperature was reported at six stations on the 2d, at eleven on the 3d, at seven on the 4th. In the central division the lowest temperature was reported at ten stations on the 3d, and at twelve on the 4th. The lowest temperature in the southern division was reported on the 3d at six stations, on the 4th at sixteen, and on the 5th at two.

The highest temperature in February, 1886, was 63°.60, at Saint Louis, Missouri, on the 8th, and the lowest, —24°.00, at Cedarville, Stephenson county, on the 3d. The highest temperature noted in February for a term of years has been as follows: 1882, 76°; 1883, 78°; 1884, 69°; 1885, 72°; 1886, 63°.60. The lowest temperature noted for the same months during the years named was as follows: 1882, 2°; 1883, —22°; 1884, —12°; 1885, —33°; 1886, —24°.

The mean temperature of the state for the month of February during the past five years has been as follows: 1882, 39°.41; 1883, 26°.44; 1884, 30°.16; 1885, 18°.49; 1886, 27°.36.

**Precipitation.**—The precipitation in February, 1886, including melted snow, averaged but 1.78 inches at the forty-nine stations reporting precipitation, and was 1.10 inches less than the average February rainfall of the last twelve years. The February, 1886, rainfall was less than that of the corresponding month in nine years and exceeded it only in 1877 by 1.68 inches, in 1879 by 0.14 of an inch, and in 1885 by 0.49 of an inch. The rainfall was quite general over the state on the 10th, 11th, 12th, 24th, 25th, 27th, and 28th of February. No rain or snow was reported from any portion of the state on the 16th, 17th, 20th, 22d, and 26th. The average precipitation of the month at stations from which reports have been received for a term of years was less than the normal at twenty stations, and more than the normal at three.

The snowfall of the month occurred almost altogether on the 28th throughout the state, the amount falling on other days being so small as to be scarcely worth noting. The snow which was on the ground the first of the month, averaging 6.08 inches, almost entirely disappeared during the warm rains of the 10th, 11th, and 12th, and the ground remained bare until the 28th.

The following is an extract from a report furnished by Prof. F. H. Snow, of the University of Kansas, from observations taken at Lawrence, Kansas:

The temperature of this month was nearly of the average value, nine of the eighteen preceding Februaries having been colder, and nine of them warmer than the month just passed. The rainfall was less than half the average

amount; the wind velocity was nearly normal and the cloudiness below the average.

**Mean temperature.**—The mean temperature was 31°.64, or 0°.60 below the February average; the highest temperature was 62°.00 on the 22d, and the lowest, 7°.00 below zero, on the 4th, giving a range of 69°.00. The temperature fell below zero on three days; the mean temperature at 7 a. m. was 24°.93; at 2 p. m., 39°.41; and at 9 p. m., 31°.11.

**Precipitation.**—The rainfall, including melted snow, was 0.56 inch, or 0.74 inch below the February average; rain or snow in measurable quantities fell on seven days. There was one thunder shower. The entire depth of snow was one inch.

**State of the sky.**—The mean cloudiness was 42.38 per cent., the month being 4.24 per cent. clearer than usual; the number of clear days was 14; half clear, 7; cloudy, 7; there were five entirely clear days and six entirely cloudy days; the mean cloudiness at 7 a. m. being 45 per cent.; at 2 p. m., 43.57 per cent.; and at 9 p. m., 38.57 per cent.

**Winds.**—The prevailing direction of the wind was southwest, and the total velocity 11,170 miles, or 212 miles above the February average; the highest velocity was forty-one miles per hour, on the 24th.

**Relative humidity.**—The mean relative humidity for the month was 78.6 per cent., the greatest being 100 per cent. on four days, and the least, 31.0 per cent. on the 17th.

The following meteorological summary and accompanying remarks are from the February, 1886, report of the "Indiana Weather Service," under direction of Prof. W. H. Ragan, of De Pauw University, Greencastle:

Districts.	Temperature.			Precipitation.	Winter of 1885-'86.		
	Highest.	Lowest.	Monthly mean.		Mean temperature.	Rain and melted snow.	Total snowfall.
Northern counties.....	67	—18	26.1	1.03	24.7	7.82	16.1
Central counties.....	60	—16	27.2	1.45	26.7	7.76	20.9
Southern counties.....	62	—13	30.0	1.92	29.7	8.20	17.9
State.....	62	—18	27.8	1.47	23.7	7.93	21.6

**Weather and precipitation.**—The greater number of days were clear or fair, and the rains and snows were generally light. At eight stations, in the centre and south, an average of 8.1 days were clear, 7.0 fair, 12.9 cloudy, and 0.01 or more precipitation fell on 8.9.

**Temperature.**—The first five days were very cold; the 9th, 10th, 11th, 12th, quite warm, in general. The general result was somewhat below normal, but much higher than last year. The mean, for the month and winter, was below normal at Logansport; 2°.8 and 1°.6 below at Spiceland; 4°.0 and 3°.6 below at Indianapolis; 0°.0 and 1°.6 above at Connersville; 4°.4 below and 0°.1 above at Maury; 0°.4 below and 0°.2 above at Sunman; 0°.1 below and 0°.6 above at Worthington; 5°.3 and 2°.4 below at Vevay, and 3°.6 and 1°.6 below at Blue Lick; and for the state, 3°.1 and 1°.3 lower than in 1883; 5°.9 and 2°.2 lower than in 1884; 9°.5 and 4°.6 higher than in 1885, and 0°.1 and 0°.3 higher than the four-year normals. These winter normals are, however, probably much too low, the last four winters having been cold. The highest station mean was 32°.5, and winter, 32°.1, and lowest, 23°.8 and 23°.8; highest maximum, 62° and 62°; lowest minimum, —18° and —25°; state range, 80° and 87°; average station range, month only, 63°.6; greatest, 75°; least, 53°.

**Precipitation (inches).**—The precipitation was light and unevenly distributed through the month and over the state, varying from an aggregate of 13.55 (at twenty-six stations) on the 11th, to 0.01 or less on the 4th, 5th, 6th, 7th, 8th, 9th, 10th, 17th, 22d, 27th, and from 3.05 at Degonia Springs, to 0.50 at Fort Wayne. For the winter the range was from 12.61 at Marengo to 5.61 at Lafayette. For the month and winter the snowfall ranged from 10.0 and 42.8 to 0.5 and 12.0. The principal precipitation during the month fell on the 11th (13.55); 12th (5.78); 15th (7.22); 24th (4.55); 25th (10.51), in connection with low barometer areas of considerable energy. Principal snows fell on the 2d (south), 13th, 14th (north), 15th, 19th, 21st, 25th, 28th. Rain or snow, in some portion of the state, on twenty days. Total precipitation was below normal, for the month and winter, — and — at Logansport; 1.90 and 1.66 at Spiceland; 1.82 and 1.71 at Indianapolis; 1.42 and 4.11 at Vevay, and for the state was less 6.53 and 4.98 than in 1883; 3.95 and 3.09 than in 1884; 0.56 and 3.68 than 1885; 2.76 and 2.94 below normal. The snowfall appears to have been below normal.

The following is an extract from the February, 1886, report of the "Minnesota Weather Service," under direction of Prof. Wm. W. Payne, Carleton College, Northfield:

The average mean temperature of Minnesota, as deducted from reports from the several stations of the Minnesota Weather Service, is 13°.1; this is 12°.2 warmer than the preceding month of January, much warmer than February, 1885, and slightly above the average of that month, for the three preceding years, 1885, 1884, 1883. The difference in the average temperature for the month between the northern and southern parts of the state has been less than usual, the coldest station, Saint Vincent, in the extreme northwest, having an average of 4°.9, and La Crosse, in the extreme southeast, 21°.8, thus giving a

range of but 16°.9 between the coldest and warmest stations. The temperature has varied from about the normal in the southern part of the state to two degrees above the normal in the the Red River Valley and northern districts.

The warmest part of the state, as usual, has been the forest region in the east, and the southern part, east of the longitude of Mankato, and below the altitude of 1,000 feet.

The most important meteorological feature of the month was the cold term, with accompanying high pressure, which, beginning on the 1st in the Northwest, by the morning of the 2d had covered the entire state, and during its continuance produced the lowest temperatures for the month at all stations. A peculiarity of this cold term was that the lowest temperatures during its continuance were recorded in the southern part of the state, the lowest temperature at any one place, —40°.6, being noted at Carleton College Observatory, Northfield, on the morning of the 4th.

On the 5th the advance of a "chinook" wind, or warm wave, from the northwest, caused a rapid rise in the temperature and an exceedingly mild term which lasted until the 11th, and produced the highest readings of the month, generally, at all stations north of the latitude of Saint Paul. High temperatures were: Duluth, 55°.4, on the 10th; Saint Vincent, 49°.5, on 7th, and 43°.0, on the 8th; Grand Forks, 45°, on 6th and 7th, and 42°.0, on 23d; Crookston, 42°.0, on 7th and 8th; Moorhead, 50°.0, on 7th. From the 11th to 23d the weather was mild and variable, when, on the latter date, the approach of a cyclone or storm-centre from the northwest, with accompanying low pressure, was preceded by southerly gales and a rapid rise in temperature, during which the highest temperatures of the month occurred in the southern part of the state, as follows: La Crosse, 52°.0, on 24th; Mankato, 50°.0, on 24th; Bird Island, 50°.0, on 24th; and Red Wing, 46°.2, on same date. The passage of this low area to the east was followed in its wake by heavy northwesterly gales with following wind velocities: Northfield, northwest, thirty-six miles; Saint Paul, west, twenty-six miles; and Bird Island, the phenomenal velocity of sixty miles per hour, northwest, on 23d, 24th, and 25th. The largest monthly movements of wind, in miles, were: Bird Island, 12,280; Moorhead, 9,934; and Saint Vincent, 7,997. The least movements: Saint Paul, 4,791; Red Wing, 3,905. The average direction of the wind, was, as is common for a winter month, from the northwest.

**Precipitation.**—The precipitation, as is usual for a winter month in Minnesota, has been small, and, in contrast with January, quite evenly distributed throughout all parts of the state. It has been nearly all in the form of snow, though rain, at various times, has occurred in small amounts at all stations. The first decade of the month was without appreciable precipitation, but after the 11th snow in small quantities was incident to nearly every day. The largest amount at any one time was on the 27th and 28th, when a light snow storm was general throughout the state. The largest total fall for month was at Northfield, 9.8 inches, and Mankato, 8.8 inches. Light rain occurred at Saint Vincent on the 12th; Moorhead, 20th; Grand Forks, 20th; and Spring Valley, 18th. The depth of snow on the ground at the end of the month varied from 1 inch at Morris to 14 and 16 inches at Albert Lea and Northfield. In the western and northwestern part of the state the warm weather of the 5th to 11th melted nearly all the snow, and the ground was practically bare until covered by the light snows of the 27th and 28th. Though somewhat interfered with by thawing weather, logging operations have proceeded uninterruptedly, and it is probable that the lingering season will admit of nearly a full cut throughout the timber districts for the next season's supply.

The comparative absence of snow in western Minnesota and in Dakota makes it probable, provided the snows of March are light and so soon as the warm sun of the early spring thaws the ground a few inches, that seeding will begin and be completed at an earlier date than usual, a condition much to be desired as increasing the probability of an abundant harvest.

The following meteorological summary and accompanying remarks are from the February, 1886, report of the "Indiana Weather Service," under direction of Prof. H. A. Huston, of Purdue University, Lafayette:

Districts.	Temperature.			Average precipitation.
	Highest.	Lowest.	Monthly mean.	
Northern counties.....	57.0	—13.5	25.96	1.33
Central counties.....	59.7	—16.0	27.18	4.59
Southern counties.....	62.0	—13.0	28.13	7.55
State.....	62.0	—16.0	27.09	4.49

The mean temperature of the state for February was 0°.77 above that for the last three years; 5°.68 below the mean of fifteen years at Indianapolis; 8°.48 below the mean of twenty-six years at Logansport; 8°.81 below the mean of twenty-one years at Vevay; 1°.41 below the mean of thirty-two years at Spiceland; 3°.59 above the mean of six years at Mauzy; 7°.51 below the mean of eight years at Blue Lick; 2°.51 below the mean of four years at Worthington; and 0°.69 below the mean of seven years at this station. The mean temperatures at the various stations are below the normal, the amounts ranging from 0°.50 to 5°.25.

The mean precipitation for the state was 1.35 inches below the mean of the past three years; 2.06 inches below the mean of fourteen years at Indianapolis;

1.38 inches below the mean of twenty-one years at Vevay; 1.36 inches below the mean of three years at Spiceland; 2.91 inches below the mean of six years at Mauzy; 3.04 inches below the mean of five years at Blue Lick; 3.27 inches below the mean of four years at Worthington; and 2.57 inches below the mean of seven years at this station. The precipitation at the various stations ranged from 1.9 to 3.32 inches below the normal. The mean snowfall for the state is 0.4 inch below the mean of the past three years. The distribution of the snow was abnormal, there being three times as much in the southern counties as in the northern.

The following is an extract from the February, 1886, report of the "Missouri Weather Service," under direction of Prof. Francis E. Nipher, Washington University, Saint Louis:

The temperature of February has been 33°.0, or 2°.4 below the normal, and the rainfall has been 1.63, or 0.9 inch below the normal.

The extreme temperatures, —4° on the 3d and 58°.9 on the 8th, are ordinary temperatures. The temperature fell to, or below, zero on three days, viz., on the 2d, 3d, and 4th, and fell to, or below, 32° on nineteen days, while on five days (the first five of the month) it did not rise above 32°.

In the state the rainfall was less than one inch in the western and northern parts, and in a region immediately northwest of Saint Louis, bounded by a line running near Hannibal, Louisiana, Washington, Chamois, and Mexico. To the southeast the fall is greater, being about 2.5 inches in the southeast part of the state.

The lowest temperatures reported are: —20°, at Kirksville; —17°.7, at Keokuk; —18°, at Mexico and Steelville. The highest temperatures were 73°, at Pro Tem, Taney county; 68°, at Greenfield; and 66°, at Sedalia and Chamois.

Oregon reports: "The heavy snow which covered the earth during January melted, so that sleighing ended February 9th, after thirty-six days' continuance. The ground was not frozen much, and nearly all the water from the melting snow entered the earth. Wheat and grass are generally in good condition. The earth is now covered by three inches of snow, and more is falling."

Chamois: "The temperature for the month is only 0°.37 below the normal for the last fourteen years, but there has been a deficiency of precipitation of 2.66 inches below the average of the last eight years, the average for that time being 3.40 inches."

Houstonia: "Mock suns were seen on the 13th, 14th, and 17th, and also on the 3d, when they were accompanied by the upper contact arc of the halo of 46°. On the 24th the snow disappeared. The ground was frozen to the depth of about two feet, and not yet thawed out."

Pro Tem, Taney county: "Heavy snowfall of 17 inches on the 1st and 2d; the largest fall since 1856. Mean temperature of the winter, 33°.11, or 2°.76 below the average of the last four years."

Savannah: "Wheat was looking well when the snow left. Freezing and thawing has killed the tops somewhat, but the roots are all right yet. Peaches are killed as far as I have examined. Apples are all right. Ice has frozen during the winter to a depth of 18 inches. The ground was not much frozen, owing to the heavy snow."

Glasgow: "Ice moved out in the Missouri River on the 15th."

The following is an extract from the February, 1886, report of the "Nebraska Weather Service," under direction of Prof. Goodwin D. Swezey, of Doane College, Crete:

**Cold waves and storms.**—Five cold waves, the first a severe one, have been experienced during the month; the first brought the lowest temperature of the month on the 4th; the others came on the 10th, 15th, 20th, and 25th; they were all predicted in good time by the Signal Office at Washington, and cold-wave flags displayed accordingly at the central office, at Omaha, at Lincoln, and at St. Joseph. At this station the signal was hoisted from fourteen to thirty-four hours before the lowest temperature. No severe storms have occurred in the state.

**Weather.**—On the whole the weather has been about normal for February, except that the highest temperatures for the month have been higher than usual. The mean temperature for the southeast section has been slightly above the normal, and the precipitation somewhat deficient; in the western part of the state, however, and especially in the central, it has been much warmer than usual.

One hail storm, a very unusual feature for February, is reported from West Hill. Thunder-storms, not usually so rare, have not been reported from any station, although distant lightning was seen by observers at Crete and Weeping Water.

**Winds.**—The highest wind velocity reported was at the central station, forty-two miles per hour, on the 24th.

**Precipitation.**—The average rain for the different sections of the state for February, 1886, is as follows: Northeast section (two stations), 0.58 inch; west section (one station), 0.93 inch; south-middle section (two stations), 0.50 inch; southeast section (covering essentially what has heretofore been the "whole state" as far as reporting), 0.70 inch; state average by sections, 0.68 inch.

Wild geese were seen flying north by various observers from the 16th to the 23d, and wild ducks were seen during the last week of the month. Mirage was several times reported at Marquette, and halos were seen by several observers.

The following is an extract from the February, 1886, "Bulletin of the New England Meteorological Society," under direction of Prof. Winslow Upton, Providence, Rhode Island:

*Summary for February, 1886.*

Reports for the month were received from one hundred and forty observers. *General conditions.*—The meteorological conditions of the month may be briefly enumerated in six divisions: First, 1st-8th; generally fair and cold, with the minimum temperatures experienced on the 5th and 6th. On the 4th a severe cyclonic depression moved northeasterly in the Atlantic, causing strong winds and snowfall at stations along the southern and eastern coast. The maximum snowfall, 10 inches, was reported at New Bedford and Nantucket. Second, 9-15th; temperature above the average, increasing cloudiness, culminating in general rains, which were of unusual severity in southern New England on the 11th and 12th. Two depressions moved northeasterly along the westerly limit of the districts on the 13th and 15th, respectively: Third, 16-18th; fair and cold. Fourth, 19th-22d; cloudy, with rain and snow attending three depressions which moved easterly, the first and second across the northern portion on the 19th and 21st, and the third north of the district on the 22d. Fifth, 23d-24th; clear and cold. Sixth, 25-28th; a period of very violent winds, with snow and rain on the 25th and 26th, attending the passage of a cyclonic depression of marked intensity.

*Special features.*—The following deserve prominent mention:

1. *The heavy rains of the 11th and 13th:* On the 11th the pressure was abnormally high, 30.9 inches in the eastern portion. Copious rains were falling in the west, a barometric trough, 30.0 inches, extending from the Gulf of Mexico to the lakes. A cyclonic depression formed in the Ohio Valley on the 11th and took a definite path on the 12th in Illinois. The pressure fell rapidly and the centre passed along the Saint Lawrence Valley on the 13th. The rainfall was general throughout New England, but in the southeastern portion was unprecedented. In southeastern Connecticut and Rhode Island over eight inches fell, and about two inches must be added to this amount from the melting snow and ice in estimating the quantity of water which poured into the rivers. The resulting damage to property was very great.

2. *The violent winds of the 25-28th:* A depression of great energy moved easterly across New England on the 25th and 26th from the Lake region. The pressure fell to 28.68 at Gardiner, Maine, where the storm was central as it passed. The barometric gradients were very steep, especially after the passage of the centre. On the morning of the 27th the pressure ranged from 28.89, at Yarmouth, Nova Scotia, to 29.95, at Albany, and on the morning of the 28th from 29.26 to 30.10 at the same stations, while it was 30.5 in the upper lake region. High winds necessarily resulted from such differences of pressure. The precipitation was snow turning to rain and then to snow again. The temperature was far below freezing before the storm began, but rose rapidly as it approached and fell with equal rapidity after its passage.

*Miscellaneous.*—Auroras were reported on the 10th at Burlington and Saint John; 22d at Eastport, Kent's Hill, and Cambridge (suspected); 9th, 17th (suspected), 18th (suspected) at Newburyport; 24th at Bar Harbor.

Thunder and lightning were noted at Bridgeton, evening of the 13th in west; Lunenburg, 14th, 8.30 p. m., and Littleton, 14th, lightning seen in southeast. On the 15th many observers made similar reports, varying in time from 8 p. m. at Blue Hill to 11.45 p. m. at Saint John. At Bar Harbor the heaviest thunder occurred at 9.20 and the storm was severe. On this date a depression was moving northeasterly along the Saint Lawrence Valley, and the above reports are from places situated about one hundred and fifty miles southeast from the centre.

The newspapers report three shocks of earthquake at midnight and at 2.20 a. m. of the 3d instant at Bridgeport, Connecticut, and vicinity.

The verification of the daily weather indications displayed by local flag signals gives a percentage of 89.3 for weather and 89.3 for temperature at New Haven, and 82.0 for weather and 90.0 for temperature at twelve other stations.

The following summary is made from reports furnished by Prof. B. F. Thomas, of the Ohio State University, Columbus, Ohio, director of the "Ohio Meteorological Bureau," in advance of the regular monthly report:

*State summary.*

Mean temperature, 25°.9; highest temperature, 65°.1, at McConnellsville, on the 11th; lowest temperature, -18°.3, at Wauseon, on the 5th; range of temperature, 83°.4; mean daily range of temperature, 18°.5; greatest daily range, 48°.0, at Ohio State University, on the 17th; least daily range of temperature, 2°.8, at Toledo, on the 7th.

Average monthly precipitation, 1.42 inches; greatest rainfall, 3.25 inches, at New Alexandria; least rainfall, 0.47 inch, at Napoleon.

Average number of days on which rain or snow fell, 9.0; average number of

cloudy days, 10.8; average number of fair days, 10.7; average number of clear days, 6.5.

Prevailing direction of the wind, southwest.

The following is an extract from the "Tennessee State Board of Health Bulletin," for February, 1886, prepared under the direction of J. D. Plunkett, M. D., President of the State Board of Health. The summary is prepared by Major H. C. Bate, in charge of the State Meteorological Service:

The month of February presented several abnormal features, the chief of which were the extraordinary depth of snowfall and the low temperature during the early portion of the month, and the high winds which prevailed during the latter portion. Taken altogether it was a very disagreeable month.

The mean temperature was 36°.56, 2°.79 above the mean for the corresponding period last year, and 8°.44 below the mean for February, 1884. The mean of maximum temperatures was 62°.97, respectively 4°.60 and 6°.26 below that for the corresponding periods in 1885 and 1884. The mean of minimum temperatures was 6°.63 below zero, respectively 9°.43 and 14°.13 below that for February, 1885 and 1884. The maximum temperature was 70°, recorded at Lexington, on the 14th, and was 2° below the maximum of February, 1885, and 4° below that of February, 1884. The minimum temperature, 22° below zero, recorded at Austin, on the 5th, was 18° below the minimum recorded in February, 1885, and 16° below that for the same period in 1884. It may be well to observe that this minimum was recorded by a Kendall thermometer and not a standard. The lowest recorded by a standard thermometer was -18°.5, on the 5th, at Riddleton, a station some fifteen miles to the northeast of Austin.

The mean precipitation was 3.80 inches, 1.41 inches greater than that for February, 1885, and 4.65 inches less than that for the corresponding period in 1884. As in the preceding month the western division received the greatest amount, averaging over five inches, while the middle division received a little over three and a half inches, and the eastern division received only about two and three-fourths inches. The greatest precipitation occurred on the 2d, 3d, 11th, 15th, and 25th, that of the 11th being the greatest. The greatest local daily rainfall occurred at Lexington, on the 11th, and amounted to 3.20 inches. These rains were all general, and with the exception of that of the 25th, were accompanied with snow or snow and sleet. The rain of the 11th was heaviest in the western division. There were only four days reported without rain or snow, viz., 7th, 17th, 21st, and 22d.

The snowfall during the month was unprecedented in the memory of the oldest inhabitant. On the 2d, 3d, and 4th the fall reached a depth in the northern portion of the western division of more than twenty inches, and in the northern portion of the middle division from fifteen to twenty inches. The depth in the eastern division was considerably less. The greatest depth reported was twenty-seven inches, at Trenton. In the southeastern portion of the state the fall was light, being only half an inch at Parksville. According to the reports, snow fell on seventeen days in some portions of the state, as follows: 1st, 2d, 3d, 4th, 5th, 6th, 9th, 11th, 12th, 13th, 15th, 16th, 19th, 20th, 24th, 27th, 28th.

*State summary.*

Mean temperature, 36°.56; highest temperature, 70°, on the 14th, at Lexington; lowest temperature, 22° below zero, on the 5th, at Austin; range of temperature, 92°; mean monthly range of temperature, 68°.88; greatest monthly range of temperature, 86°, at Austin; least monthly range of temperature, 57°, at Chattanooga and Waynesborough; mean daily range of temperature, 18°.27; greatest daily range of temperature, 49°, on the 5th, at Paris; least daily range of temperature, 1°, on the 2d, at Florence Station, Ashwood, Waynesborough, and Lexington; mean of maximum temperatures, 62°.97; mean of minimum temperatures, -6°.63; mean depth of rainfall (including melted snow), 3.80 inches; mean daily rainfall (including melted snow), 0.136 inch; greatest rainfall, 6.74 inches, at Trenton; least rainfall, 0.79 inch, at Greenville; greatest local daily rainfall, 3.20 inches, on the 11th, at Lexington; days of greatest rainfall (including snow and sleet), 2d, 3d, 11th, 15th, 25th; day of greatest rainfall, 11th.

Average number of days on which rain or snow fell, 8.5; average number of clear days, 11; average number of fair days, 8; average number of cloudy days, 9.

Mean depth of snowfall, 10.28 inches; greatest depth of snowfall, 27.25 inches, at Trenton; least depth of snowfall, 0.50 inch, at Parksville.

Days without rain or snow, 7th, 17th, 21st, 22d; warmest days, 11th, 14th and 23d; coldest days, 4th and 5th.

Prevailing winds, west and northwest.